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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/770,381	12/03/96	KESSLER D	74508NAB

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EXAMINER	
WILSON, J	
ART UNIT	**PAPER NUMBER**
2712	8

DATE MAILED: 06/22/99

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No. 08/770,381	Applicant(s) Kessler et al.
	Examiner Jacqueline Wilson	Group Art Unit 2712

☒ Responsive to communication(s) filed on *Apr 26, 1999* .

☒ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire *three* month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) *1, 2, and 4-16* is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) *1, 2, and 4-16* is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐approved ☐disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____ .

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____ .

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

DETAILED ACTION III

Response to Arguments

1. Applicant's arguments filed April 26,1999 have been fully considered but they are not persuasive. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Fukushima '420 teaches an optical filter formed of birefringent crystal such as lithium niobate and being greater than 0.05 (col. 5, lines 1-5). The examiner understands that the invention of Greivenkamp, Jr. '193 in combination with Fukushima '420 may not function in a manner as the applicant's invention. However, the claims are written broad enough to be rejected using the teachings of the prior art. Therefore, the rejections of claims 1, 2, and 4-16 below are maintained.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 2, 7, 9, 10, 11, 12 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Greivenkamp, Jr. '193 and Fukushima (U.S. 5,579,420).

Regarding Claim 1 and 2, Greivenkamp, Jr. '193 teaches an imaging apparatus for generating an image signal from incident light with higher spatial frequencies of the incident light limited to reduce undersampling artifacts comprising an image sensor for generating the image signal from an array of photosites, and an optical section having a birefringent uniaxial crystal optical filter interposed in a path of the incident light to produce a blurred image on the photosites (col. 1, lines 40-55; col. 3, lines 50-65). However, Greivenkamp, Jr. '193 fails to disclose the birefringent uniaxial crystal optical filter birefringence is greater than 0.05 and being made of lithium niobate.

Fukushima '420 teaches an optical filter formed of birefringent crystal such as lithium niobate (col. 5, lines 1-5). Lithium niobate has a birefringent value of 0.09, which is greater than 0.05. The strong wavelength dependent characteristic of the polarization conversion resulting from the birefringent characteristic of lithium niobate makes the device useful in applications such as multiplexing and/or demultiplexing. Therefore, it would have been obvious to one of ordinary

skill in the art to have the birefringent crystal optical filter to be made of lithium niobate which has a birefringence greater than 0.05.

Regarding Claim 7, Greivenkamp, Jr. '193 fails to disclose the optical filter is comprise of a first plate and a second plate of lithium niobate. However, Fukushima '420 teaches that the first, second and third birefringent elements are formed of a birefringent crystal such as lithium niobate (col. 5, lines 1-5). The strong wavelength dependent characteristic of the polarization conversion resulting from the birefringent characteristic of lithium niobate makes the device useful in applications such as multiplexing and/or demultiplexing. Therefore, it would have been obvious to one of ordinary skill in the art to have the first plate of lithium niobate to diffract the path of the incident light.

Regarding Claim 9, Greivenkamp, Jr. '193 does not specifically disclose a thickness of the first plate is not equal to a thickness of the second plate. However, Fukushima '420 teaches the filter units are made different from each other (col. 11, lines 41-60). It would be advantageous to have the first filter plate not to be equal to a thickness of the second plate to prevent the undesired beams once deviated from the optical paths may be returned to the optical paths. Therefore, it would have been obvious to one of ordinary skill in the art to have the first plate not to equal the second plate in the imaging apparatus.

Regarding Claim 10, Greivenkamp, Jr. '193 teaches the four spot rays (See Fig. 2a).

Regarding Claim 11, Greivenkamp, Jr. '193 teaches the optical section includes a lens and the optical filter is positioned between the lens and the photosites for blurring the image on the photosites (See Fig. 1; col. 3, lines 50-65; col. 1, lines 40-50).

Claim 12 is analyzed and discussed with respect to Claim 10 and 2. (See rejection of Claims 10 and 2 above.)

Regarding Claim 15, Greivenkamp, Jr. '193 teaches the second plate comprises a plane which is tilted at a 45^0 angle to a plane of the first plate (col. 4, lines 36-45).

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Greivenkamp, Jr. '193 and Fukushima et al. (U.S. 5,646,399).

Greivenkamp, Jr. '193 teaches an imaging apparatus for generating an image signal from incident light with higher spatial frequencies of the incident light limited to reduce undersampling artifacts comprising an image sensor for generating the image signal from an array of photosites, and an optical section having a birefringent uniaxial crystal optical filter interposed in a path of the incident light to produce a blurred image on the photosites (col. 1, lines 40-55; col. 3, lines 50-65). However, Greivenkamp, Jr. '193 fails to disclose the birefringent uniaxial crystal optical filter is lithium tantalate.

Fukushima et al. '399 teaches that lithium tantalate may be used as an optical birefringent crystal element (col. 8, lines 11-15) replacing the lithium niobate. Like lithium niobate, Fukushima et al. '399 teaches that lithium tantalate may also be used to improve the mass

productivity. Lithium tantalate may also make the device useful in applications such as multiplexing and/or demultiplexing. Therefore, it would have been obvious to one of ordinary skill in the art to use lithium tantalate as a birefringent uniaxial crystal optical filter.

5. Claims 5 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Greivenkamp, Jr. '193 and Fukushima '420 as applied to claim 1 above, and further in view of Takatori et al. (U.S. 5,715,085).

Regarding Claim 5, neither Greivenkamp, Jr. '193 nor Fukushima '420 teaches an angle between an optical axis of the optical filter and a line normal to a filter facet is 37.85^0. However Takatori et al. '085 teaches that the angle of the optical filter with respect to the incident plane is set smaller than an angle of 45^0 (col. 1, lines 65-68). Takatori et al. '085 teaches that due to the fact that an angle of inclination of the optical axis of the optical filter with respect to the incident plane is set about 35^0, which includes the angle 37.85^0, even when the angle of incidence of the incident light is great, variations of the separation width between an ordinary ray and an extraordinary ray are not great, that is, the characteristic of the optical filter does not vary according to the angles of incidence of the incident light (col. 2, lines 1-9). When an angle of incidence of an incident light ray into the incident plane is large, the separation width of the ray varies greatly (col. 1, lines 40-49). It would be advantageous to have the angle set below 45^0 and about 35^0 to prevent the generation of a false signal due to the width of the ray. Therefore, it would have been obvious to one of ordinary skill in the art wherein an angle between an optical

axis of the optical filter and a line normal to a filter facets is below 45^0 and about 35^0, which includes the angle 37.85^0.

Claim 14 is analyzed and discussed with respect to Claims 1 and 5. (See rejection of Claims 1 and 5 above.)

6. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Greivenkamp, Jr. '193, Fukushima (U.S. 5,579,420), and in further view of Penunuri (U.S. 5,777,419).

Neither Greivenkamp, Jr. '193 nor Fukushima '420 teaches the optical filter is cut from a boule so that a crystal axis is at 37.85^0 to the boule axis of symmetry. However, Penunuri '419 teaches that the filter is cut from a boule so that a crystal axis is at a range of degrees to the boule axis of symmetry (See col. 5). Penunuri '419 discloses a range of cut angle values of material such as lithium niobate has minimum insertion losses for open and short circuit cases (col. 2, lines 10-20). This would be advantageous so that the insertion losses of the crystal filter would be kept to a minimum and no false signals would be generated. Therefore, it would have been obvious to one of ordinary skill in the art to have the optical filter being cut from a boule so that a crystal axis is at 37.85^0 to the boule axis of symmetry.

7. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Greivenkamp, Jr. '193 and Fukushima '420, and further in view of Watanabe et al. (U.S. 3,784,734).

Regarding Claim 8, neither Greivenkamp, Jr. '193 nor Fukushima '420 teaches a thickness of the first plate is equal to a thickness of the second plate.

However, Watanabe et al. '734 discloses that the sheets (Fig. 20, elements 34a and 34b) are identical to each other (col. 10, lines 67-68). Watanabe et al. '734 teaches the thickness of the sheets (element 34a and 34b) creates a rhomboidal pattern of the four spot to be of 45^0 (col. 11, lines 54-62; see Fig. 22). By creating the thickness of the first plate to equal to a thickness of the second plate having the rhomboidal pattern of the rays, aids in producing color video signals which do not cause any moire in the reproduced picture. Therefore, it would have been obvious to one of ordinary skill in the art to have the thicknesses of the first and the second plate to be of equal value.

8. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Greivenkamp, Jr. '193 and Fukushima '399, and further in view of Watanabe et al. (U.S. 3,784,734).

Regarding Claim 13, neither Greivenkamp, Jr. '193 nor Fukushima '399 teaches a thickness of the first plate is equal to a thickness of the second plate.

However, Watanabe et al. '734 discloses that the sheets (Fig. 20, elements 34a and 34b) are identical to each other (col. 10, lines 67-68). Watanabe et al. '734 teaches the thickness of the sheets (element 34a and 34b) creates a rhomboidal pattern of the four spot to be of 45^0 (col. 11, lines 54-62; see Fig. 22). By creating the thickness of the first plate to equal to a thickness of the second plate having the rhomboidal pattern of the rays, aids in producing color video signals which do not cause any moire in the reproduced picture. Therefore, it would have been obvious

to one of ordinary skill in the art to have the thicknesses of the first and the second plate to be of equal value.

9. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Greivenkamp, Jr. '193 and Fukushima (U.S. 5,579,420) as applied to claim 1 above, and further in view of Shoeffler et al. (U.S. 5,850,284).

Neither Greivenkamp, Jr. '193 nor Fukushima '420 specifically disclose each of the fist and second plates is coated with an anti-reflection coating. Shoeffler et al. '284 teaches the use of an anti-reflection coating disposed on a filter. Although Shoeffler et al. '284 does not specifically teach the same apparatus as the applicant, the teaching of the anti-reflection coating is used for the purpose avoiding the surface reflection typical of transparent materials which is similar to the purpose of the applicant. Therefore, it would have been obvious to one of ordinary skill in the art to include each of the first and second plates to be coated with an anti-reflection coating for preventing surface reflection.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sasaki et al. (U.S. 5,477,381)

Takasugi (U.S. 5,471,343)

Shiraishi (U.S. 5,452,129)

Sato et al. (U.S. 4,626,897)

12. Any inquiries concerning this communication from the examiner should be directed to **Jacqueline Wilson** whose telephone number is (703) 308-5080. The examiner can normally be reached Monday-Friday from 9:00 A.M. to 5:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Wendy Garber**, can be reached at (703) 305-4929. The fax number for this group is (703) 308-5399.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or Faxed to:

(703) 308-9051, (for formal communication intended for entry)

or:

(703) 308-5399, (for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, V.A., Sixth Floor (Receptionist).

JBW

June 18, 1999

Wendy Garber
Supervisory Patent Examiner
Technology Center 2700